

MULTICOLORED 35 MM SLIDES FOR DATA PRESENTATION^{1,2}

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ABSTRACT: A technique is described for producing 35 mm slides with alternating bands of color to define lines of data and, if desired, multicolored letters.

Many articles have appeared during the past 7-8 years on photographic techniques for preparing 35 mm slides for presentation of data. Most described techniques for producing slides with either black backgrounds and colored letters (Ignoffo 1972) or colored backgrounds and white letters (Elder and Agee 1977, Hefetz 1977, Ciesla 1979) or black letters (Eaton 1978).

Another method was described for producing slides with colored backgrounds and letters (Mack 1981), but this procedure does not allow for varied colors in either the background or the letters of an individual slide. Relative densities of background and letter color cannot be varied.

Presented here is a technique which not only allows for the background to be colored, but also banded to allow for segregation of data (Fig. 1). It is also possible to have letters of several colors on the same slide.

Preparation of Slides

This process requires 3 major steps: 1) preparation of a Kodalith negative with colored letters, 2) preparation of gelatin filters, with optional bands, for background, and 3) double-exposure of both of these onto a single frame of Ektachrome film.

STEP 1. Prepare your line copy with push-off letters, being careful not to include too much data. Pieters (1977) guidelines should be followed. Photograph the line copy with Kodalith Ortho film, 6556, type (Ignoffo 1972). The negatives may be left black and white. However, for colored letters on the final slide, paint the letters (e.g., Dr. Ph. Martin's Synchromatic Transparent Water Colors by Salis International, 4040 N. 29th Ave., Hollywood, FL 33020), attach transparent acetate colors (e.g., Zipatone, Inc., 150 Fencil Ln., Hillside, IL 60162) or place a colored gelatin filter (e.g., Special Effects Assortment by Spiratone, 135-06 Northern Blvd., Flushing, NY 11354) over the negative. Mount the

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negative in a slide mount.

STEP 2. Place the desired color gelatin filter in an empty slide mount to provide background color. To create a banded effect, carefully cut neutral density filters (also available from Spiratone; Warming and Cooling Assortment), or other colors, to the band width desired, and place these on the background color filter. Care must be taken to position the bands in the same location on this slide as the data you want to delineate on the Kodalith slide. Pressure from the slide mount will hold the bands in position.

STEP 3. A camera body capable of taking double-exposures, such as the Nikon FM2, is loaded with Kodak Ektachrome 64 daylight film and attached to a bellows and slide copier. An electronic flash is used to individually expose each of the 2 slides prepared in steps 1 and 2. The order of exposure does not matter, and exposure should be varied by changing the distance of the flash to the slide copier, keeping the aperture constant (i.e., $f/16$) to maintain maximum depth of field. Different densities of color filters will require different exposures. For example, we positioned a Braun Hobby EF300 flash (guide number 80 at ASA 25) 40 cm from the slide copier for low density filters (e.g., lime green) and 20 cm for high density filters (e.g., dark blue). Exposure for the Kodalith slide must be determined separately, but holding this flash 40 cm away was correct for most backgrounds. Each photographer will have to determine the correct exposure for their equipment since light gathering capabilities of lenses

NEST	RM	DIAM
1	10	15
2	21	15
3	27	18
4	64	20
5	67	36

Fig. 1. A diagrammatic representation of a slide showing lines of data separated by color density. For additional segregation or emphasis, the numbers can be photographed in contrasting colors.

vary. However, bracketing 3 exposures, with one on either side of optimal, should yield the correct exposure. Extreme care should be taken to load the slides so the banding will be aligned with the appropriate data on the Kodalith slide. When exposing the background, move the lens off focus so that minor imperfections in the gelatin filter are not in sharp focus. Develop the film with E-6 processing. Most photographic laboratories offer 1-day service, or it can be done at home.

The backgrounds most pleasing to us are dark blue, lime green and olive green (orange + lime green). Most of the long wavelength colors (i.e., red to yellow) appear too gaudy, and probably should be avoided. Banding with neutral density strips gives alternating light and dark shades of the same color (Fig. 1). Letter colors (e.g., yellow, orange, red and blue) that contrast with the background should be selected.

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